BULL. BOT. SURV. INDIA
Vol. 10, Nos. 3 & 4: pp. 260-262, 1968

PHARMACOGNOSTIC STUDIES ON THE STEM BARK OF *STREBLUS ASPER* LOUR.

RAI H. N. CHAUDHURI

Botanical Survey of India, Calcutta

ABSTRACT

The macroscopic and microscopic studies of the stem bark of *Streblus asper* Lour. are made. Macroscopic characters reveal that the outer surface of the bark has got longitudinal wrinkles with transverse channels. On drying the bark can be easily separated into two layers; the outer hard and the inner fibrous layer. Two types of stone cells, phloem fibres with broad lumen and large prismatic crystals of calcium oxalate are the chief diagnostic characters.

Streblus asper Lour. Hindi: Daheya; Sans.: Gavakshi; Beng.: Sheora; Tam.: Kuttippirai; Tel.: Kakkanbediis is a small evergreen tree of the family Urticaceae. According to Ayurveda the plant is useful in leprosy, piles, "Vata" and "Kapha", diarrhoea, dysentery, elephantisis and tuberculous glands. The milky juice is astringent and has got antiseptic properties. It is applied to sore heels. The bark in decoction is given in fevers, dysentery and diarrhoea. The roots are used as an application to unhealthy ulcers and sinuses (*Kirtikar & Basu,* 1935; *Nadkarni,* 1954; *Watt,* 1889-92; *Biswas & Ghosh,* 1950). The Pharmacognostic as well as Pharmacological studies of the root bark reveal that although the tincture prepared according to I. P. is found to be a little more toxic than that of Digitalis I. P., the drug has a definite action on the Myocardium (*Iyengar & Pendse,* 1963; *Fernandes & Kamat,* 1961). The Pharmacognostic studies of the stem bark have been taken up in order to identify the bark easily and properly when they are found either in a mixed up condition or in a powdered form.

Distribution: The plant is found in the drier parts of India. It grows usually in open fields, dry soils and in the coastal regions. The plant is cultivated in the Deccan in the South and is also available in Dahisar near Maharashtra and Anjarle in Ratnagiri district (*Cooke,* 1907; *Iyengar & Pendse,* 1963; *Gamble,* 1957; *Haines,* 1961; *Hooker,* 1885; *Prain,* 1963).

Materials & Methods: Fresh samples of stem bark were collected from different parts of India and compared with the authentic bark samples. Transverse, radial-longitudinal and tangential-longitudinal sections of these bark samples were cut and examined under the microscope in order to study the nature of variations if any. These sections do not show any structural difference or peculiarities. Some good sections were made permanent after suitable staining for pharmacognostic studies and future reference. Samples of bark were dried in air and powdered in 60 mesh B. S. sieve and the powders were cleared in chloral hydrate for the study of the different diagnostic elements.

Macroscopic characters: The outer surface of the stem bark is yellow to cream in colour when dried, sometimes with a whitish coating. Internal colour brown. The outer surface when dried becomes cracked by which the outer hard portion can be separated from the inner fibrous layer. Fracture hard but outer layer is brittle while inner portion is fibrous. Mainly the outer surface has longitudinal wrinkles but in some portion of the bark transverse channels are also noticed. The stem bark is 3-7 mm thick when dried.

Microscopic characters: Transection of the bark shows the following structural characteristics.

Cork consists of 4-8 layers of radially arranged rows of cells which are elongated tangentially. The cork cells are chocolate brown in colour and their walls are suberized. Cork cells measure $T = 15\mu\text{-}27\mu\text{-}38\mu$; $R = 11\,\mu\text{-}15\mu\text{-}19\mu$ and $L = 8\mu\text{-}13\mu\text{-}19\mu$. Next to the cork cells lies a layer of thin walled phellogen. Below the phellogen 2-3 layers of thin-walled phelloderm or secondary cortical cells are found. The cortical cells are either rectangular or oval or polygonal in shape (Plate I, figs. 1 & 2). These cells contain starch grains which are simple and round. The cortical parenchymatous cells measure $T = 8\mu\text{-}23\mu\text{-}38\mu$; $R = 8\mu\text{-}15\mu\text{-}23\mu$ and $L = 8\mu\text{-}15\mu\text{-}23\mu$. Next to the narrow cortex shows aggregation of stone cells more or less in tangential bands. Some scattered stone cells are also found in this region intermingled with thin walled cortical cells. The stone cells are of two types, the first one is the usual type i.e. with thicker walls and narrow lumen and pores in their walls while the majority of them show prominent round simple pitting with comparatively thinner walls (Text fig. 1). The stone cells in this region measure T=30μ-57μ-84μ; R=15μ-30μ-49μ and L=19μ-30μ-44μ. Phloem which occupies about sixty per cent of the total thickness of the bark consists of phloem parenchyma, sieve tubes with companion cells and phloem fibres. The phloem parenchyma cells are thin walled and are of various sizes and shapes. Most of them are large while some smaller phloem parenchyma cells are also found. Phloem parenchyma cells are elongated either tangentially or radially. Phloem parenchyma cells contain starch grains and large prismatic crystals of calcium oxalate. These cells measure T=23μ-49μ-68μ; R=11μ-27μ-34μ and L=19μ-30μ-47μ. Phloem fibres are radially arranged, almost in vertical columns, intermingled with the soft cells of the phloem and these columns alternate with wide phloem rays. The fibres are mostly thin walled with large lumen (Plate I, figs. 1 & 2 and Text fig. 1). Medullary ray is usually 2-3 celled wide and run in parallel rows radially separating the phloem in groups. Medullary ray cells are mostly rectangular or polygonal in shape. They are elongated radially and thin walled. Thin walled stone cells although found throughout the phloem are mainly concentrated in the medullary ray region i.e. on

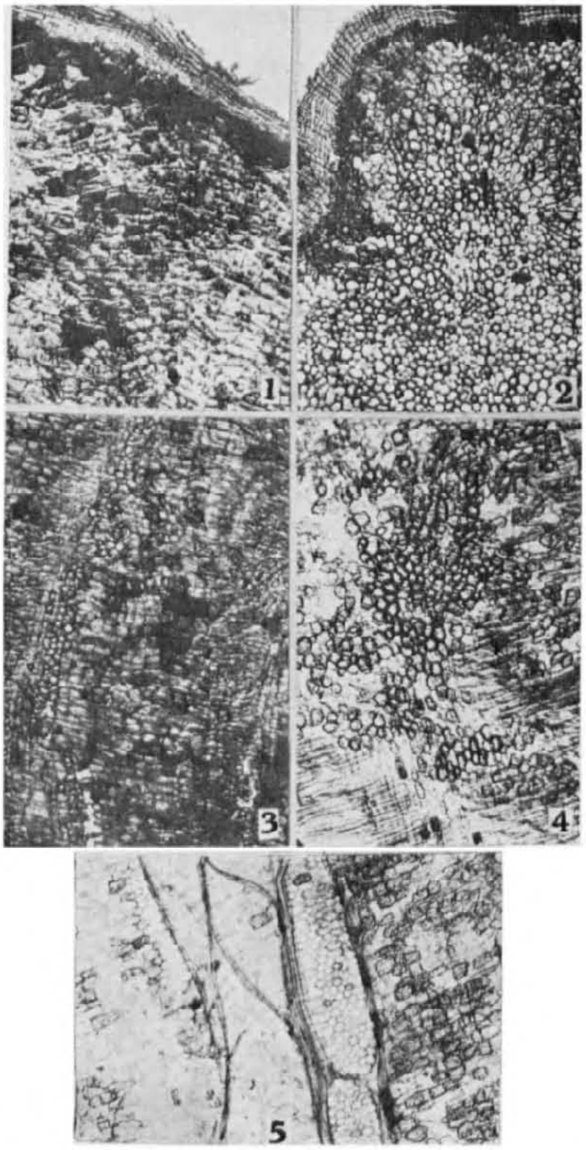
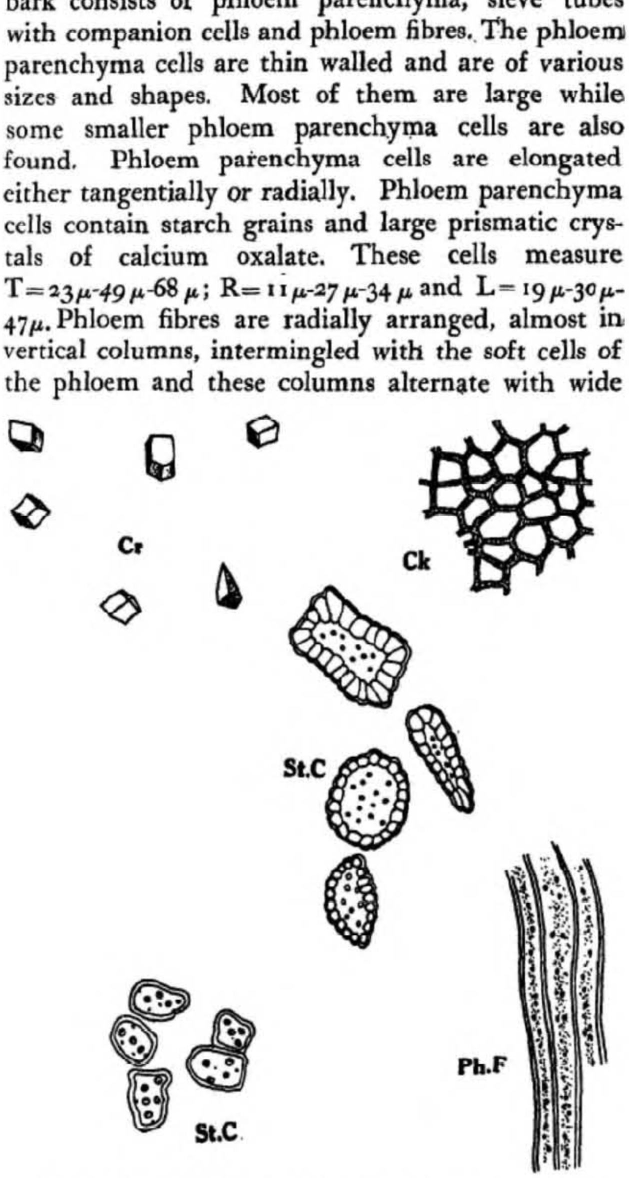


Plate I ; Figs. 1-5 : 1. Transverse section of the stem bark of *Streblus asper* Lour. (outer region) ×180. 2. Transverse section of the stem bark of *Streblus asper* Lour. (inner region) ×165. 3. Radial longitudinal section (outer region) ×165. 4. Radial longitudinal section (inner region) ×165. 5. Tangential longitudinal section ×170.



Text fig. 1 : Camera lucida drawings of the different diagnostic elements as found in the powdered bark ×600.
Ck=Crok cells; Cr.=Crystals; Ph. F.=Phloem fibres; St. C.=Stone cells (thick & thin walled).

either side of the medullary ray and mostly in vertical groups. Medullary ray cells measure $T=15\mu$-27μ-38μ ; $R=11\mu$-23μ-34μ and $L=11\mu$-34μ-57μ. The stone cells in the phloem region measure $T=30\mu$-49μ-76μ ; $R=15\mu$-23μ-31μ and $L=15\mu$-30μ-42μ (Plate I, figs. 1 & 3).

Powder : Yellowish brown in colour and without any appreciable taste and odour. The powder when examined under the microscope is characterised by the presence of small groups of cork cells, phloem fibres either single or in groups of 3-6. Large number of prismatic crystals of calcium oxalate and stone cells either scattered or in small groups. (Text fig. 1).

ACKNOWLEDGEMENTS

The author wishes to express his indebtedness to Rev. Father Dr. H. Santapau, for his kind interest. Thanks are also due to Dr. S. C. Datta, Scientist-in-Charge, Central Indian Medicinal Plants Organisation, C.S.I.R., for his valuable suggestions.

REFERENCES

BISWAS, K. AND A. GHOSH. *Bharatiya Banausadhi* 3: 519. Calcutta, 1952.

COOKE, T. *Flora of Bombay*. Reprinted Edition 3: 141. Calcutta, 1958.

FERNANDES, F., V. N. KAMAT AND S. S. BHATNAGAR. A preliminary note on the chemical and pharmacological examination of *Streblus asper* Lour. *Curr. Sci.* 30 : 320, 1961.

GAMBLE, J. S. *Flora of Madras*. Reprinted Edition 3 : 947. Calcutta, 1957.

HAINES, H. H. *Botany of Bihar & Orissa*. Reprinted Edition 3 : 860. Calcutta, 1961.

HOOKER, J. D. *The Flora of British India* 5 : 489. London, 1885.

IYENGAR, M. A. AND G. S. PENDSE. Studies on the pharmacognosy of the root bark of *Streblus asper* Lour. at its tincture. *Indian J. Pharm.* 25 : 372, 1963.

KIRTIKAR, K. R. AND B. D. BASU. *Indian Medicinal Plants* 3 : 2304. Allahabad, 1935.

Ministry of Health, Govt. of India. *Pharmacopoeia of India* 761. Delhi, 1966.

PRAIN, D. *Bengal Plants*. Reprinted Edition 2 : 969. Calcutta, 1963.

WATT, G. *Dictionary of the Economic Products of India* 6 (3): 373. Calcutta, 1893.